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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,128	10/14/2004	Eivind Berg	21649.26545	7879

7590 06/27/2006

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EXAMINER

HUGHES, SCOTT A

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/501,128

Applicant(s)

BERG, EIVIND

Examiner

Scott A. Hughes

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/18/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13, 16-22, 24 and 31-41 is/are pending in the application.
- 4a) Of the above claim(s) 32-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 16-22, 24 and 31-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/9/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/17/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 13, 16-22, 24, 31, and 41, in the reply filed on 4/17/2006 is acknowledged.

The objection to the drawings is withdrawn as applicant has cancelled the claims that were drawn to subject matter not shown in the drawings.

Applicant's amendments are sufficient to overcome the objections to the specification and the claims.

Applicant's amendments to the claims are sufficient to overcome the 35 USC 112 rejections of the prior action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13, 16, 18-20, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caldwell in view of Sparrevik.

With regard to claim 13, Caldwell discloses a sensor arrangement for use in seismic investigation of geological formations below the seabed (Fig. 1) (Page 1274, Columns 1-2). Caldwell discloses a plurality of sensor nodes (Fig. 1), which are positioned for deployment on the seabed to acquire pressure waves and shear waves

from the geological formations and to transfer seismic data to a surface receiver (Page 1274; 1278 – “Sensor system design and construction” to 1280, Column 2), wherein each sensor node comprises a substantially cylindrical skirt (Fig. 1) that is adapted to penetrate into the seabed and at least a first geophone that is connected to the skirt (1274; 1278 – “Sensor system design and construction” to 1280, Column 2). Caldwell discloses a sensor package containing geophones that is attached to a skirt. Caldwell does not specifically disclose that the bottom of the skirt is open. Caldwell discloses that the skirt is added to the base of the sensor package and that the skirt solves the problem of stability when the node is implanted into the seafloor (1280) (Fig. 1).

Sparrevik teaches a cylindrical skirt that is used to penetrate the seafloor and to couple a seismic device to the seafloor (in this case a seismic wave generator, not sensors). Sparrevik teaches that the cylindrical skirt is open on the bottom (Figs. 1-13) (abstract; Pages 4-5). It would have been obvious to include the open bottom type skirt taught by Sparrevik as the skirt in the device of Caldwell in order to allow the skirt to penetrate downwards into the seabed and to allow for pumps and suction to allow for deeper penetration into the seabed.

With regard to claim 16, Caldwell discloses a housing that encloses the first geophone and is positioned at the top of the cylindrical structure (Fig. 1) (1278 – “Sensor system design and construction” to 1280, Column 2).

With regard to claim 18, Caldwell discloses a grip that is fixed to the top for use with a ROV ROT (1278 – “Sensor system design and construction” to 1280, Column 2).

With regard to claim 19, Caldwell discloses that the sensor node is connected to a control unit through an acoustic insulated cable (Fig. 1) (1278 – “Sensor system design and construction” to 1280, Column 2).

With regard to claim 20, Caldwell does not disclose what material is made out of, but from Fig. 1 the skirt appears to be metallic. Sparrevik teaches that the skirt used for penetrating the ocean bottom is a metallic skirt (Page 4). It would have been obvious to modify Caldwell to include a metallic skirt as taught by Sparrevik that is made out of aluminum as aluminum is a metal known to be used in seabed applications (See Donoho Column 6).

With regard to claim 31, Caldwell discloses a housing (sensor portion above skirt) (Fig. 1) that encloses at least one geophone, and that the geophone is positioned at the top of the cylindrical skirt to contact the surrounding sediments when the housing is lowered into the seabed (Fig. 1) (1274; 1278 – “Sensor system design and construction” to 1280, Column 2).

Claims 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caldwell in view of Sparrevik as applied to claim 16 above, and further in view of Suarez.

With regard to claim 17, Caldwell discloses that the device includes a hydrophone in the housing, but does not disclose the location of the hydrophone (1274-1280). Suarez teaches that hydrophones in seabed nodes that include geophones and hydrophones are placed in the outer top part of the cylinder (open cage) (last Fig. on the

right of Fig. 2.3.3 – appears to match device of Fig. 1 in Caldwell) (Page 17, Last paragraph to Page 18). It would have been obvious to modify Caldwell to include the hydrophone in the outer top part of the cylinder as taught by Suarez in order to isolate the hydrophone for the obtaining of pressure signals.

With regard to claim 21, Caldwell does not disclose the exact location of the hydrophone. From Fig. 1 and the teaching of Suarez that the hydrophone is in the outer top part of the cylinder, it would be obvious that the separation between the geophones and hydrophone would be 10 cm based on the dimensions of the device as seen in the figure.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Caldwell in view of Sparrevik as applied to claim 16 above and further in view of Grant (3D*4C).

With regard to claim 22, Caldwell discloses that the housing encloses three geophones positioned at 90-degree angles in relation to each other (Page 1274, second column; 1278 – “Sensor system design and construction” to 1280, Column 2). Caldwell does not disclose the use of a tilt meter. Grant teaches the use of sensor nodes including geophones and a hydrophone on the seabed using a skirt to penetrate the seabed (Page 1). Grant teaches that the device also includes a tiltmeter (compass and inclinometers) (Page 1). It would have been obvious to modify Caldwell to include a tiltmeter as taught by Grant in order to measure the orientation of the unit on the seafloor.

Claims 24 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caldwell in view of Sparrevik as applied to claim 19 above and further in view of Vincent.

With regard to claim 24, Caldwell discloses that the cable is received into the sensor node through an opening in the sensor housing, not through the skirt. Vincent teaches a device for deployment on the ocean bottom that includes sensors and a skirt designed for penetrating the bottom (Figs. 1-3). Vincent teaches that a cable 27 that transmits data from the device passes through an outlet in the upper part of the skirt 28 (Columns 3-4). It would have been obvious to modify Caldwell to include the cable passing through an opening in the skirt as taught by Vincent in order to be able to bury the cable under the seabed with the skirt.

With regard to claim 41, Vincent teaches that outlets in the skirt allow for sediment to be discharged when the sensor node is deployed (Column 4). It would have been obvious to modify Caldwell to include an outlet port that is adapted to discharge sediment in order to be able blow away the sediment below the sensor node to create a recess for the receipt of the skirt on the seabed.

Conclusion

The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SAH


JACK KEITH
SUPERVISORY PATENT EXAMINER